

REMARKS

Claims 1 and 3-38 are pending in this application. By this Amendment, claim 2 is cancelled, claims 1, 4-7, 9, 10, 12, 15, 17, 18 and 20 are amended, and claims 21-38 are added. Reconsideration and withdrawal of the rejections in view of the foregoing amendments and the following remarks is respectfully requested.

The Office Action indicates that claims 2, 6, 10-15 and 17-20 contain allowable subject matter. The Applicant acknowledges the indication of allowable subject matter with appreciation.

I. Claim Rejection 35 U.S.C. §112

The Office Action rejects claims 1-20 under 35 U.S.C. §112, second paragraph. Because claims 1-20 have been amended for clarity and to particularly point out and distinctly claim the subject matter which the Applicants regard as their invention, the rejection is respectfully traversed. Applicants respectfully request that the rejection of claims 1-20 be withdrawn.

II. Claim Rejection 35 U.S.C. §103

The Office Action rejects claims 1, 7, 9 and 16 under 35 U.S.C. §103(a) over U.S. Patent No. 6,148,647 to Kabeya et al. (hereinafter "Kabeya"). The rejection is respectfully traversed.

Independent claim 1 has been amended to incorporate the allowable subject matter of dependent claim 2, and claim 2 has been cancelled. Thus, independent claim 1 should be in



allowable condition. Dependent claims 7, 9 and 16 are allowable for at least the reasons discussed above with respect to independent claim 1, from which they depend, as well as for their added features. Accordingly, Applicant respectfully requests that the rejection of claims 1, 7, 9 and 16 be withdrawn.

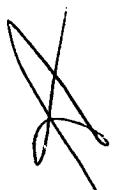
The Office Action rejects claim 3 under 35 U.S.C. §103(a) over Kabeya, in view of U.S. Patent No. 6,341,507 to Rode et al. This rejection is respectfully traversed.

Independent claim 1, from which claim 3 depends, has been amended to incorporate allowable subject matter. Thus, dependent claim 3 is allowable for at least the reasons discussed above with respect to independent claim 1, from which it depends, as well as for its added features. Accordingly, Applicant respectfully requests that the rejection of claim 3 be withdrawn.

The Office Action rejects claims 4 and 5 under 35 U.S.C. §103(a) over Kabeya, in view of U.S. Patent No. 6,131,422 to Skrippek et al. This rejection is respectfully traversed.

Independent claim 1, from which claims 4 and 5 depend has been amended to incorporate allowable subject matter. Thus, dependent claims 4 and 5 are allowable for at least the reasons discussed above with respect to independent claim 1, from which they depend, as well as for their added features. Accordingly, Applicants respectfully request that the rejection of claims 4 and 5 be withdrawn.

The Office Action rejects claim 8 under 35 U.S.C. §103(a) over Kabeya in view of U.S. Patent No. 5,996,379 to Skrippek et al. This rejection is respectfully traversed.



Independent claim 1, from which claim 8 depends, has been amended to incorporate allowable subject matter. Thus, dependent claim 8 is allowable for at least the reasons discussed above with respect to independent claim 1, from which it depends, as well as for its added features. Accordingly, Applicants respectfully request that the rejection of claim 8 be withdrawn.

III. New Claims 21-38

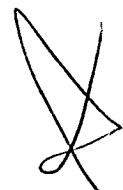
By this Amendment, claims 21-38 are added to this application. Independent claim 21 incorporates the allowable subject matter of original claim 10, and thus should be in condition for allowance. Claims 22 and 23 depend from claim 21 and should be in allowable condition for at least for the reasons that claim 21 is allowable, as well as for their added features.

New claim 24 includes the allowable features of original claim 2. Claims 25-31 depend from claim 24 and are allowable for at least the same reasons as claim 24.

Independent claim 32 includes the allowable features of claim 18. Dependent claims 33-35 depend from claim 32 are allowable for at least the same reasons.

Independent claim 36 is directed to a method of forming a tub of a washing machine. Independent claim 36 incorporates the allowable subject matter of original claim 2 and thus should be in condition for allowance. Claims 37 and 38 depend from claim 36 and are allowable for at least the same reasons.

It is respectfully submitted that new claims 21-38 are in condition for allowance.

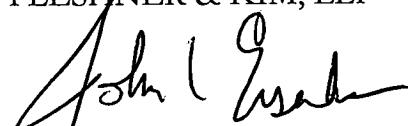


IV. Conclusion

In view of the foregoing amendments and remarks, it is respectfully submitted that the application is in condition for allowance. If the Examiner believes that any additional changes would place the application in better condition for allowance, the Examiner is invited to contact the undersigned attorney, John C. Eisenhart, at the telephone number listed below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this, concurrent and future replies, including extension of time fees, to Deposit Account 16-0607 and please credit any excess fees to such deposit account.

Respectfully submitted,
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Amended Claims With Mark-ups to Show Changes Made

1. (Amended) A [structure of a] driving unit in a drum type washing machine comprising:

a tub [of] comprising plastic and including an opened front, a closed rear wall, and a sidewall [extended from a periphery of a rear wall to be] extending from a periphery of the rear wall to the opened front, wherein the tub is cylindrical, and a thickness of the rear wall being thicker than that of the sidewall];

a drum mounted rotatably in the tub;

a [hollow metal] bearing housing [integrated in a central portion of the rear wall of the tub] comprising metal, and including a cylindrical aperture therethrough defining an inner circumference, wherein the bearing housing is mounted proximate to a central portion of the rear wall of the tub by insert injection molding;

a shaft [passed] passing through the bearing housing, the shaft having one end connected to the drum [and the other end connected to a rotor of the motor];

[bearings] at least one bearing mounted between the shaft and the bearing housing for supporting the shaft;

a stator [of a crown form] fixed at a central portion of the rear wall of the tub, the stator including a magnetic core having a stack of layers of magnetic material and a winding part having a coil wound thereon for forming a magnetic force; and



a rotor [including] comprising a [back-yoke for forming a flux,] sidewall, a rear wall and a permanent magnet fixed to the [back yoke, and a rear wall integrated with the back yoke] sidewall, wherein the rotor is coupled to the shaft.

4. (Amended) A [structure] driving unit as claimed in claim 1, wherein the at least one bearing comprises a front bearing and a rear bearing, and wherein the bearing housing has steps formed on front and rear portions of the inner circumference thereof for supporting [a] the front bearing and [a] the rear bearing, wherein the steps are [respectively positioned on the inner circumference of the bearing housing for preventing] configured to fix the respective bearings [from being fallen off the bearing housing] therein.

5. (Amended) A [structure] driving unit as claimed in claim [1] 4, wherein[, of] the [steps, a] step formed at [a] the front portion of the inner circumference of the bearing housing [has a “]” form for forming a structure which supports] is configured to support a rear end of the front bearing [mounted on a front end portion of the shaft among the bearings mounted on opposite end portions of the outer circumference of the shaft], and[, of] the [steps, a] step formed at [a] the rear portion of the inner circumference of the bearing housing [has a “[” form for forming a structure which supports] is configured to support a front end of the rear bearing [mounted on a rear end portion of the shaft among the bearings mounted on opposite end portions of the outer circumference of the shaft].



6. (Amended) A [structure] driving unit as claimed in claim 1, wherein the at least one bearing comprises a front bearing and a rear bearing, and wherein the shaft has a front end portion fixed to a spider in [the] a rear wall of the drum, and a region [from a portion exposed to outside of] of the shaft between the spider [to] and the front bearing [with] comprises a brass bushing [press fit] attached thereon [for prevention of shaft rusting].

7. (Amended) A [structure] driving unit as claimed in claim 1, further comprising a stator supporter inserted between the rear wall of the tub and the stator [fixed to the rear wall for making stable fixing of the stator to the tub despite the vibration of the tub and prolonged use].

9. (Amended) A [structure] driving unit as claimed in claim 1, wherein the rotor [includes] comprises:

a bent portion formed along a circumference [thereof having a setting surface] of the sidewall, wherein the bent portion is configured for supporting magnets fitted to an inside of a front portion of [a] the sidewall [extended forward from a periphery of a rear wall; and a hub at a center of the rear wall having a through hole for fastening members for coupling the rotor to the shaft].



10. (Amended) A [structure] driving unit as claimed in claim 1, wherein the rotor [includes] comprises:

a plurality of cooling fins [integrated with] formed in the rear wall [thereof], wherein each cooling fin is formed in a radial direction thereof [by lancing to have a length and be directed toward an opening thereof] and configured for blowing air toward the stator for cooling [down a heat generated at the stator when the rotor is rotated]; and

a plurality of [the through] cooling holes [formed by the lancing] configured for ventilation.

12. (Amended) A structure as claimed in claim 1, wherein the rotor further includes:

a hub at a center of the rear wall of the rotor having a [through] hole therethrough [for] configured to receive at least one fastening [members] member for coupling the rotor to the shaft which passes therethrough, and

fastening holes and positioning holes both formed around the through hole in the hub of the rotor at fixed intervals, the fastening holes for fastening a connector serration coupled to an outer circumference of the rear end portion of the shaft exposed to rear of the rear bearing, and the positioning holes for positioning an assembly position of the connector.

15. (Amended) A [structure] driving unit as claimed in claim 1, wherein the tub includes[;]:



a hub comprising an external circumference defining an outer side of the hub,
wherein the hub is fixed [integrated therewith] in the rear wall [thereof, the hub having] of the
tub and has the bearing housing is inserted therein, and

fastening bosses disposed on an outer side of the hub [along a circumferential
direction] at fixed intervals and configured for fastening the stator to the rear wall of the tub
with fastening members.

17. (Amended) A [structure of] driving unit in a drum type washing machine
comprising:

a cabinet;

a tub of plastic mounted inside [of a] the cabinet;

a metallic bearing housing comprising a cylindrical aperture therethrough defining
an internal circumference, wherein said metallic bearing housing is disposed [inserted and built]
in a central portion of a rear wall of the tub,[having] and the metallic bearing housing further
comprises steps [of "J" and "L" forms] on [an] the inner circumference for supporting bearings
therein;

a drum mounted inside the tub, wherein the drum comprises a rear wall;

a shaft connected [to a drum mounted inside of the tub] to the drum for
transmission of a driving power from a motor to the drum, [having] wherein the shaft has a
front end portion fixed to a spider in [the drum] a rear wall of the drum, a brass bushing press



fit on a region of the shaft from a portion exposed [in] between a rear of the spider [to the] and a front bearing for prevention of rusting of the shaft, and steps on an outer circumference thereof for fixing mounting positions of [the] a front bearing and [the] a rear bearing on the shaft;

[bearings] a front bearing and a rear bearing, each of which are mounted on the outer circumference of the shaft at opposite [end portions] ends thereof respectively;

a rotor [of steel or steel alloy plate] comprising metal coupled to the rear end portion of the shaft, [including] the rotor comprising:

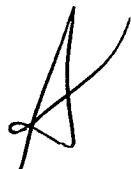
a bent portion formed along a circumference [thereof having] of the rotor including a setting surface configured for supporting magnets fitted to an inside of a front portion of a sidewall of the rotor extended forward from a periphery of a rear wall of the rotor, and

a hub at a center of the rear wall of the rotor having a [through] hole therethrough for a fastening member, [such as a bolt,] for coupling the rotor to the shaft,

a plurality of cooling fins [formed around the hub in a radial direction each with a length] configured for blowing air toward the stator when the rotor is rotated [for cooling down a heat generated at the stator],

an embossing between adjacent cooling fins on the rear wall of the rotor for reinforcing the rotor, and

a drain hole in each of the embossings, [for drain of water];



a stator [composing the motor together with the rotor,] fixed to the tub rear wall inward of the rotor;

a connector of plastic [provided between] configured to connect the shaft [and] to the rotor [for transmission of a rotating force from the rotor to the shaft for rotating the shaft and the rotor together]; and,

a supporter fitted between the rear wall of the tub and the stator for supporting the stator and maintaining a concentricity between the stator and the tub when the stator is mounted to the tub rear wall.

18. (Amended) A [structure of] driving unit in a drum type washing machine comprising:

a cabinet;

a tub mounted inside [of a] the cabinet;

a drum mounted inside [of] the tub;

a shaft connected to the drum [mounted inside of the tub] configured for transmission of a driving force from a motor to the drum;

a front bearing and a rear bearing mounted on an outer circumference of the shaft at opposite end portions thereof, respectively;

a [metallic] bearing housing [built] comprising metal disposed in a central portion of a rear wall of the tub for supporting the front bearing;

a rotor [composing the motor together with the rotor, and coupled] fixed to the rear end portion of the shaft;

a stator fixed to the tub rear wall inward of the rotor [to compose the motor together] and configured to magnetically communicate with the rotor;

a connector comprising at least one serration [coupled to] fixed between the outer circumference of the shaft in front of the rear bearing and [fixed to] the rotor, and configured, for transmission of a rotating power from the rotor to the shaft; and,

a bearing bracket fixed to the rear wall of the tub and configured to cover an outside of the rotor and to support the rear bearing.

20. (Amended) A [structure of] driving unit in a drum type washing machine comprising:

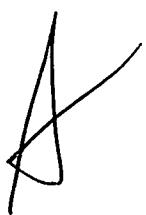
a cabinet;

a tub of plastic mounted inside [of a] the cabinet;

a metallic bearing housing inserted [to built in] into a central portion of a rear wall of the tub having steps on an inner circumference for supporting bearings therein;

a drum mounted inside of the tub;

a shaft connected to [a drum mounted inside of the tub] the drum and configured for transmission of a driving power from a motor to the drum, having a front end portion fixed to a spider in the drum rear wall, and a brass bushing [press fit] fitted on a region of the shaft



from a portion exposed [in rear of] between the spider to [the] a front bearing [for prevention of rusting of the shaft];

bearings mounted on the outer circumference of the shaft at opposite end portions thereof, respectively;

a rotor [of steel or steel alloy plate] comprising metal coupled to the rear end portion of the shaft, [including] the rotor comprising:

a bent portion formed along a circumference thereof having a setting surface configured for supporting magnets fitted to an inside of a front portion of a sidewall of the rotor extended forward from a periphery of a rear wall of the rotor, and

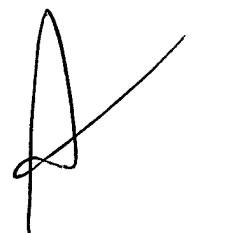
a hub at a center of the rear wall of the rotor having a [through] hole [for] therethrough configured to receive a fastening member, [such as a bolt,] for coupling the rotor to the shaft,

a plurality of cooling fins formed around the hub [in a radial direction each with a length] and configured for blowing air toward the stator when the rotor is rotated [for cooling down a heat generated at the stator],

an embossing between adjacent cooling fins on the rear wall of the rotor for reinforcing the rotor, and

a drain hole in each of the embossings, [for drain of water];

a stator [composing the motor together with the rotor,] fixed to the tub rear wall inward of the rotor;



a connector [of] comprising plastic [provided between] configured to connect the shaft [and] to the rotor [for transmission of a rotating force from the rotor to the shaft for rotating the shaft and the rotor together];

a supporter fitted between the rear wall of the tub and the stator configured for supporting the stator and maintaining a concentricity between the tub and the stator when the stator is mounted to the tub rear wall; and,

a bearing bracket fixed to the rear wall of the tub to cover an outside of the rotor and support the rear bearing.